DOWNHOLE VIBRATION MONITORING & CONTROL SYSTEM
QUARTERLY PROGRESS REPORT #16

Starting date:	July 1, 2006
Ending Date:	September 30, 2006
Principal Author:	Martin E. Cobern
Date Issued:	October 19, 2006
DOE Award Number:	DE-FC26-02NT41664
Submitting Organization	APS Technology, Inc. 800 Corporate Row Cromwell, CT 06416

DISCLAIMER

ABSTRACT

The objective of this program is to develop a system to both monitor the vibration of a bottomhole assembly, and to adjust the properties of an active damper in response to these measured vibrations. Phase I of this program, which entailed modeling and design of the necessary subsystems and design, manufacture and test of a full laboratory prototype, was completed on May 31, 2004.

The principal objectives of Phase II were: more extensive laboratory testing, including the evaluation of different feedback algorithms for control of the damper; design and manufacture of a field prototype system; and, testing of the field prototype in drilling laboratories and test wells. Phase II concluded on January 31, 2006, and the final report was issued.

Work on Phase III of the project began during the previous quarter. Efforts this quarter have focused on the manufacture of the prototype and precommercial parts, field test planning and commercialization.

The current extreme lead times quoted by oilfield machine shops for collar components, will delay the deployment of the field prototypes. The delivery date for five critical parts from one supplier has slipped to late November, which will preclude deployment for a field test before late December or early January. We are exploring whether we can take the partially made parts and complete them earlier in our own shop.

Table of Contents

Executive Summary

The objective of this program is to develop a system to both monitor the vibration of a bottomhole assembly, and to adjust the properties of an active damper in response to these measured vibrations. Phase I of this program, which entailed modeling and design of the necessary subsystems and design, manufacture and test of a full laboratory prototype, was completed on May 31, 2004.

The principal objectives of Phase II were: more extensive laboratory testing, including the evaluation of different feedback algorithms for control of the damper; design and manufacture of a field prototype system; and, testing of the field prototype in drilling laboratories and test wells. Phase II concluded on January 31, 2006, and the final report was issued.

Work on Phase III of the project began during the previous quarter. Efforts this quarter have focused on the manufacture of the prototype and precommercial parts, field test planning and commercialization.

The current extreme lead times quoted by oilfield machine shops for collar components, will delay the deployment of the field prototypes. The delivery date for five critical parts from one supplier has slipped to late November, which will preclude deployment for a field test before late December or early January. We are exploring whether we can take the partially made parts and complete them earlier in our own shop.

Design

Redesign of laboratory prototype

COMPLETE.

Design of feedback system

COMPLETE.

Intermediate prototype design

COMPLETE

Design of field prototype tool

COMPLETE

While key parts were ordered as soon as their designs were frozen, the present boom in oil & gas drilling has created long lead times at shops building BHA components. As a result, one key item now has a delivery date of September 28, which will prevent the completion of the prototype by the end of Q3. [***Note***: After the end of Q3, the delivery date for five key components slipped into November.]

Design of precommercial prototype tool

The precommercial prototype was essentially complete at the end of this quarter, and the parts have all been ordered. Some small modifications may be made, based on the results of early field tests.

Experimental

Retesting of DVMCS prototype

COMPLETE

Preparations for Testing at TerraTek

COMPLETE

Testing at TerraTek Drilling Laboratory

COMPLETE.

Field Testing

We have been talking to RMOTC and are planning to do the first field test there, if a mutually agreeable schedule can be developed. If not, two major production companies have expressed interest in testing the tool on commercial wells.

Analysis

TerraTek data

COMPLETE.

Commercialization

We have been speaking to three oilfield service/supply companies about commercializing the DVMCS. One of these seems nearly ready to commit, pending resolution of the patent questions with Sandia Laboratories. At the end of the quarter, discussions with Sandia on licensing and/or joint efforts were underway.

Discussions have begun with two major oil companies who have expressed an interest in using the DVMCS on their commercial wells.

Units

To be consistent with standard oilfield practice, English units have been used in this report. The conversion factors into SI units are given below.

1 ft.	=	0.30480 m
1 g	=	9.82 m/s
1 in.	=	0.02540 m
1 klb.	=	4448.2 N
1 lb.	=	4.4482 N
1 rpm	=	0.01667 Hz
1 psi	=	6984.76 Pa